

December 3, 1985

TO ALL LICENSEES OF OPERATING REACTORS, APPLICANTS FOR OPERATING LICENSEES,  
AND HOLDERS OF CONSTRUCTION PERMITS.

Gentlemen:

SUBJECT: POTENTIAL FOR LOSS OF POST-LOCA RECIRCULATION CAPABILITY DUE TO  
INSULATION DEBRIS BLOCKAGE (Generic Letter 85-22 )

This letter is to inform you about a generic safety concern regarding LOCA - generated debris that could block PWR containment emergency sump screens or BWR RHR suction strainers, thus resulting in a loss of recirculation or containment spray pump net positive suction head (NPSH) margin.

The potential exists for a primary coolant pipe break to damage thermal insulation on the piping as well as that on nearby components. Insulation debris could be transported to water sources used for long-term post-LOCA recirculation and containment sprays (i.e., PWR containment emergency sumps and BWR suction intakes in the suppression pools) and deposited on debris screens or suction strainers. This could reduce the NPSH margin below that required for recirculation pumps to maintain long-term cooling.

This concern has been addressed as part of the efforts undertaken to resolve USI A-43, "Containment Emergency Sump Performance." The staff's technical findings contain the following main points.

- ° Plant insulation surveys, development of methods for estimating debris generation and transport, debris transport experiments, and information provided as public comments on the findings have shown that debris blockage effects are dependent on the types and quantities of insulation employed, the primary system layout within containment, post-LOCA recirculation patterns and velocities, and the post-LOCA recirculation flow rates. It was concluded that a single generic solution is not possible, but rather that debris blockage effects are governed by plant specific design features and post-loca recirculation flow requirement.
- ° The current 50% screen blockage assumption identified in Regulatory Guide (RG) 1.82, "Sumps for Emergency Core Cooling and Containment Spray Systems," should be replaced with a more comprehensive requirement to assess debris effects on a plant-specific basis. The 50% screen blockage assumption does not require a plant-specific evaluation of the debris-blockage potential and usually will result in a non-conservative analysis for screen blockage effects.

The staff has revised Regulatory Guide (RG) 1.82, Revision 0, "Sumps for Emergency Core Cooling and Containment Spray Systems" and the Standard Review Plan Section 6.2.2, "Containment Heat Removal Systems" based on the

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above technical findings. However, the staff's regulatory analysis (NUREG-0869, Revision 1, "USI A-43 Regulatory Analysis") evaluated (1) containment designs and their survivability should loss of recirculation occur, (2) alternate means to remove decay heat, (3) release consequences (which were based on pipe break probabilities which did not incorporate insights gained from recent pipe fracture mechanics analyses), and (4) cost estimates for backfits considered (i.e., reinsulating). This regulatory analysis did not support a generic backfit action and resulted in the decision that this revised regulatory guidance will not be applied to any plant now licensed to operate or that is under construction. The revised guidance will be used on Construction Permit Applications, Preliminary Design Approval (PDA) applications, and applications for licenses to manufacture that are docketed after six (6) months following issuance of RG 1.82, Revision 1, and Final Design Approval (FDA) applications, for standardized designs which are intended for referencing in future Construction Permit Applications, that have not received approval at six (6) months following issuance of the RG 1.82, Revision 1.

Although the staff has concluded that no new requirements need be imposed on licensees and construction permit holders as a result of our concluding analyses dealing with the resolution of USI A-43, we do recommend that RG 1.82, Revision 1 be used as guidance for the conduct of 10 CFR 50.59 reviews dealing with the changeout and/or modification of thermal insulation installed on primary coolant system piping and components. RG 1.82, Revision 1 provides guidance for estimating potential debris blockage effects. If, as a result of NRC staff review of licensee actions associated with the changeout or modification of thermal insulation, the staff decides that Standard Review Plan Section 6.2.2, Revision 4 and/or RG 1.82, Revision 1 should be (or should have been) applied to the rework by the licensee, and the staff seeks to impose these criteria, then the NRC will treat such an action as a plant-specific backfit pursuant to 10 CFR 50.109. It is expected that those plants with small debris screen areas (less than 100 ft<sup>2</sup>), high ECCS recirculation pumping requirements (greater than 8000 gpm), and small NPSH margins (less than 1 to 2 ft of water) would benefit the most from this type of assessment in the event of a future insulation change. RG 1.82, Revision 0 with its 50% blockage criteria does not adequately address this issue and is inconsistent with the technical findings developed for the resolution of USI A-43.

This information letter along with enclosed copies of NUREG-0897, Revision 1, RG 1.82, Revision 1 and SRP Section 6.2.2, Revision 4 should be directed to the appropriate groups within your organization who are responsible for conducting 10 CFR 50.59 reviews.

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No written response or specific action is required by this letter. Therefore, no clearance from the Office of Management and Budget is required. If you have any questions on this matter, please contact your project manager.

Original Signed by  
Hugh L. Thompson, Jr.

Hugh L. Thompson, Jr., Director  
Division of Licensing

Enclosure:  
NUREG-0897, Revision 1  
RG 1.82, Revision 1  
SRP Section 6.2.2, Revision 4

\*See previous sheet for concurrence

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